IN THE CLAIMS:

Please amend claims 1- 34 as follows:

1. (Currently Amended) ~~*In*~~ An *in vivo* tomography system with high axial and lateral resolution of the human retina, comprising:

- a Michelson interferometer, producing a full-field tomography setup by interference at coherence length (OCT) with a Z scanning,
- an input light source ~~(S)~~ arranged in an input arm of the interferometer,
- adaptive optical means, designed to correct wavefronts originating from the eye and directed to the eye, comprising a reference source ~~(SLD)~~, a deformable mirror ~~(MD)~~ and means of analysing the wave surface ~~(SH)~~,
- means of detection ~~(CCD)~~, arranged in an imaging arm of the interferometer, designed to produce an image from an interferometric measurement according to the OCT principle, and
- means of adjusting ~~(LA2, LA3, LA4)~~ the focussing of the means of analysis of the wave surface ~~(SH)~~,

~~characterized in that~~ wherein the means of adjusting the focussing are arranged to force the deformable mirror to adopt an additional curvature, so as to conjugate the input light source ~~(S)~~ and the means of detection ~~(CCD)~~ with a point at a predetermined depth in the retina, said means of adjustment being controlled in synchronism with the Z scanning of the OCT tomography setup.

2. (Currently Amended) ~~System~~ The system according to claim 1, characterized in that the adaptive optical means ~~(MD, SLD, SH)~~ are arranged between the Michelson interferometer and the eye to be examined ~~(OEX)~~.

3. (Currently Amended) ~~System~~ The system according to ~~one of claims 1 or 2, characterized in that it also comprises~~ claim 1, further comprising means for controlling the adaptive optical means ~~(MD)~~ based on wavefront measurements made downstream of said adaptive optical means on a point image of the reference source ~~(SLD)~~ produced on the retina of the eye.

4. (Currently Amended) ~~System~~ The system according to claim 3, ~~characterized in that it also comprises~~ further including means ~~to introduce~~for introducing an additional light beam, independent of the measurement beam, focussed on the retina.

5. (Currently Amended) ~~System according to one of the preceding claims, characterized in that~~ The system according to claim 1, wherein the means of analysing the wave surface ~~(SH)~~ comprise an analyser of the Shack-Hartmann type.

6. (Currently Amended) ~~System according to one of the preceding claims, characterized in that it also comprises~~ The system according to claim 1, further including means ~~(CBC) to compensate~~for compensating for the effects of birefringence of the cornea, which are arranged in front of the eye ~~(OEX)~~.

7. (Currently Amended) ~~System according to any one of the preceding claims, characterized in that~~The system according to claim 1, wherein rectilinearly polarized light passes through the two arms of the interferometer.

8. (Currently Amended) ~~System~~ The system according to claim 7, ~~characterized in that it also comprises~~further including a polarizing cube ~~(CPR)~~ in order to obtain two mutually perpendicular polarizations in each arm.

9. (Currently Amended) ~~System~~ The system according to claim 8, ~~characterized in that~~ wherein the two arms of the interferometer comprise means ~~to switch~~ for switching the polarization by 90 degrees between the outward and return legs.

10. (Currently Amended) ~~System~~ The system according to claim 9, ~~characterized in that~~ wherein the means ~~of~~ for switching the polarization comprise a quarter-wave plate ~~(QOR, QOM)~~.

11. (Currently Amended) ~~System according to one of claims 7 to 10, characterized in that~~ The system according to claim 7, wherein the interferometer is illuminated with linearly polarized light ~~(S, P)~~.

12. (Currently Amended) ~~System~~ The system according to ~~one of claims 7 to 11, characterized in that it also comprises~~ claim 7, further including means ~~of~~for adjusting the orientation of the input rectilinear polarization ~~(P)~~, so as to obtain a predetermined division of the fluxes injected into the two arms of the interferometer.

13. (Currently Amended) ~~System~~ The system according to ~~claims 6 and 10, characterized in that~~ claim 6, wherein the quarter-wave plate ~~(QOM)~~ is placed closest to the eye, before the birefringence compensation means.

14. (Currently Amended) ~~System~~ The system according to ~~one of the preceding claims, characterized in that it also comprises~~claim 1, further including means of filtering the corneal reflection.

15. (Currently Amended) ~~System~~ The system according to claim 14, ~~characterized in that~~ wherein the means ~~of~~ for filtering the corneal reflection comprise a field diaphragm ~~(DCM)~~ arranged to diaphragm the essential component of the flux reflected by the cornea.

16. (Currently Amended) ~~System according to one of the preceding claims, characterized in that it also comprises~~ The system according to claim 1, further including means ~~of~~ for tuning the adjustment to a given depth, through reaction of the adaptive optical means ~~(MD)~~ to an overall defocussing of the assembly constituted by the reference source ~~(SLD)~~ and the analyser means ~~(SH)~~.

17. (Currently Amended) ~~System according to one of the preceding claims, characterized in that it also comprises~~The system according to claim 1, further including an active target pattern ~~(MAM)~~.

18. (Currently Amended) ~~System according to any one of the preceding claims, characterized in that it also comprises~~The system according to claim 1, further including means ~~of~~for freezing the shape of the adaptive optical means ~~(MD)~~ for the duration of an exposure.

19. (Currently Amended) ~~System according to one of the preceding claims, characterized in that~~ The system according to claim 1, wherein the reference source ~~(SLD)~~ is arranged upstream of the adaptive optical means ~~(MD)~~.

20. (Currently Amended) ~~System according to one of claims 1 to 18, characterized in that~~ The system according to claim 1, wherein the reference source ~~(SLD)~~ is inserted into the optical path between the adaptive optical means ~~(MD)~~ and the eye to be examined ~~(OEX)~~.

21. (Currently Amended) ~~System according to one of the preceding claims, characterized in that it comprises~~ The system according to claim 1, further including means ~~(IRIS)~~ for tracking the movement of the eye to be examined with the means of adjustment or detection.

22. (Currently Amended) ~~System according to one of the preceding claims, characterized in that it comprises~~The system according to claim 1, further including, in the measurement arm, means ~~of~~for compensating for the effects of the focal chromatism of the eye.

23. (Currently Amended) ~~System according to any one of the preceding claims, characterized in that it comprises~~The system according to claim 1, further including, in the reference arm, means of compensating for the dispersion of the path differences.

24. (Currently Amended) ~~*In*~~ An *in vivo* tomography method with high axial and lateral resolution of the human retina, comprising:

- a full-field tomography by interference with low coherence length (OCT) with a Z scanning, using an input light source ~~(S)~~,
- a production of an image of the retina by means of detection ~~(CCD)~~, from an interferometric measurement according to the OCT principle,
- a correction of the wavefronts originating from the eye and reaching the eye, by adaptive optical means ~~(MD, SLD, SH)~~, arranged between the interferometer and the eye, comprising an analysis of the wave surface on the retina, and
- an adjustment of the focussing of the wave surface analysis,

~~characterized in that~~ wherein the focussing adjustment is carried out so as to conjugate the input light source ~~(S)~~ and the means of detection ~~(CCD)~~ with a point of predetermined depth in the retina, in synchronism with the Z scanning of the OCT tomography.

25. (Currently Amended) ~~Method~~ The method according to claim 24, ~~characterized in that~~wherein the interferometric measurement comprises a measurement of the contrast of the fringes without modulation by the method termed Wollaston.

26. (Currently Amended) ~~Method according to one of claims 24 or 25, characterized in that it also comprises~~ The method according to claim 24, further including a compensation for the effects of birefringence of the cornea.

27. (Currently Amended) ~~Method~~ The method according to claim 26, ~~characterized in that it also comprises~~further including a linear polarization ~~(CPA)~~ of the reference source ~~(SLD)~~ and a switching of the polarization between the outward and return paths in the arms.

28. (Currently Amended) ~~Method according to one of claims 24 to 27, characterized in that it also comprises~~ The method according to claim 24, further including a filtering ~~(DCM)~~ of the corneal reflection.

29. (Currently Amended) ~~Method according to one of claims 24 to 28, characterized in that it also comprises~~ The method according to claim 24, further including a tuning the adjustment to a given depth, by controlling the adaptive optical means ~~(MD)~~ in reaction to an overall defocussing of the assembly constituted by the reference source ~~(SLD)~~ and the wave surface analyser means ~~(SH)~~.

30. (Currently Amended) ~~Method according to one of claims 24 to 29, characterized in that it also comprises~~The method according to claim 24, further including an adjustment of the focussing of the wave surface analyser means ~~(SH)~~.

31. (Currently Amended) ~~Method according to one of claims 24 to 30, characterized in that it also comprises~~The method according to claim 24, further including a freezing of the shape of the adaptive optical means ~~(MD)~~ for the duration of an exposure.

32. (Currently Amended) ~~Method according to one of claims 24 to 31, characterized in that it comprises~~The method according to claim 24, further including, in the measurement arm, a compensation for the effects of the focal chromatism of the eye.

33. (Currently Amended) ~~Method according to one of claims 24 to 32, characterized in that it comprises~~The method according to claim 24, further including, in the reference arm, a compensation for the dispersion of the path differences.

34. (Currently Amended) ~~Method according to one of claims 24 to 33, characterized in that it comprises~~ The method according to claim 24, further including a command to the wavefront analyser ~~(SH)~~ obliging it to work in defocussed mode.